REMARKS

Reconsideration of this application is respectfully requested in view of the amendments and comments that follows.

Claims 1-12 have now been replaced by new claims 13-31 which essentially correspond with the previously presented claims 1-12. The language of the claims has been revised to conform better to U.S. practice as compared to European practice and the informalities on which the Examiner based certain objections have been corrected. Appropriate antecedents are provided for all terms in the claims and alternative language (e.g., "and/or") has been removed. None of the claims were narrowed as a result of any rejection or objection by the Examiner, particularly as regards the cited prior art.

In the official action to which this paper replies, the basic reference on which the Examiner relies in rejecting the previously presented claims is Yamashita (U.S. 5,318,077) that discloses an abrasion (wear) detector for a rapier band of a rapier loom wherein the detector monitors the shifting position of a rapier band over its operational life using various forms of electrical or electronic position detectors that are capable of sensing excessive displacement of the rapier band resulting from wearing of surface areas of the band subjected to friction during operation of the loom.

Clearly, there is nothing whatsoever contained or suggested in Yamashita indicating a recognition that the temperature of the rapier band may be utilized as a wear characteristic value of the rapier band. As the Examiner recognizes, this concept lies at the core of the present invention.

The Examiner relies on Cramer (U.S. 6,000,844) as a secondary reference to support a rejection of certain previously presented claims under 35 U.S.C. § 103, contending that while Yamashita does not teach the use of a thermal energy sensor to determine wear, Cramer supplies such a teaching that could readily be incorporated in the Yamashita invention by a person skilled in the art in an obvious manner. In actuality, the Examiner's theory is fatally flawed on its face.

In the first place, neither Yamashita nor Cramer even remotely furnishes a recognition that a temperature signal indicative of the temperature of a rapier band in an operating loom can be analyzed as a wear characteristic value of the rapier band. The absence of such a recognition in any form readily refutes the Examiner's contention.

The Examiner moreover characterizes the missing element of Yamashita as a thermal energy sensor to determine wear. Actually, this is not the determinative weakness of Yamashita as a prior art reference against the claims under consideration, but rather the lacking in Yamashita of any recognition whatsoever that temperature may be used as a wear characteristic value of a rapier band of a rapier loom. Indeed, Yamashita specifically relies on friction wearing away a portion of the band resulting in movement of the band towards one side of the band that enables a sensor to determine how far the movement has occurred and to thereby provide a signal reflecting the degree of wear of the band. No temperature considerations whatsoever are revealed in Yamashita.

Cramer, on the other hand, discloses a very high precision thermal imaging system that requires a constant heat source and a system for moving a test piece at a constant speed relative to the heat source and a trailing thermal imager. The heat source must induce a constant surface temperature and the imager, that follows the heat source relative to the direction of movement of the test piece, must produce a video image of the thermal characteristics of the test surface. No actual temperatures are measured or detected. A suggestion that such a system could somehow be employed in measuring the temperature of a non-constant speed moving rapier band of a rapier loom borders on nonsense. The Examiner is fully aware that a rapier band does not move at a constant speed, but must accelerate from a standstill at a high rate of speed and decelerate and stop, followed by a very rapid acceleration and then a deceleration in the reverse direction, all under severe operating conditions. To suggest that a high precision heat source and thermal imager interacting with a constant speed test element could somehow be

incorporated in the operating rapier loom system of Yamashita defies logic. The Examiner is invited to specifically indicate to applicant how the concept, let alone the structure, of Cramer could somehow be combined with Yamashita in any shape, manner or form to result in a legal basis for rejection of the claims of this application on grounds of obviousness.

The Examiner is invited to carefully read Cramer to understand precisely the scope of its teachings and then justify the reliance on this documents as a teaching that a person skilled in the art would gain recognition that a wear characteristic value of a rapier band of a rapier loom can be obtained by analyzing a temperature signal indicative of the temperature of the rapier band during loom operation.

The present invention is not about thermal imaging nor is it about the use of thermal imaging to determine relative thicknesses of a test piece along a length of a test piece. The present invention is about the discovery that the wear characteristics of a rapier band can be analyzed and determined by measuring directly or indirectly the temperature of a rapier band and/or of a component in contact with the rapier band. As described in the specification of this application, the inventor discovered that the temperature characteristics of a rapier band varies as it wears, such that the temperature of a rapier band tends to increase during operation of the loom as the rapier band wears. The wearing of the rapier band is relatively slow and, as mentioned in the paragraph spanning pages 5 and 6 of the specification, "as a rule the critical value of wear for the known rapier bands materializes following 10,000 hours or more of operation." Obviously, the measuring or observation of the temperature of the rapier band to monitor the wear of the rapier band is a long term process involving many hours of operation of the loom.

With regard to certain prior claims, the Examiner relies on Yamashita in view of Hobgood (U.S. 4,336,708) and Turek (U.S. 5,001,925). Again, the comments above with regard to the basic deficiency of Yamashita as a basic reference applies equally with regard to this rejection. Hobgood and Turek, like Cramer, fail entirely to provided the needed teaching of obviousness to a person skilled in the art,

because none of the documents collectively or individually provide the remotest recognition that a temperature signal indicative of the temperature of a rapier band may be analyzed as a wear characteristic value of the rapier band. The fact that the various documents show other wear measuring systems or other thermal imaging arrangements fails to support and establish a *prima facie* teaching of obviousness. The secondary references were relied on by the Examiner to provide teachings of measuring temperature indirectly to obtain a signal indicative of a temperature that is not conveniently measurable directly or a temperature that is indicative of the physical characteristic of the element being tested.

Hobgood is a time and temperature monitor for determining certain parameters of liquid leaking from a pipe wherein the time history of the flowing liquid combined with the temperature history provides information about the location of a leak in the pipe and the extent of the leak. It is a total mystery how the teachings of this patent could somehow be combinable with the Yamashita abrasion detector system for a rapier band, even assuming for the sake of argument that Hobgood, as stated by the Examiner: "teaches to measure a temperature of the device in order to determine its defects/weakness/wear." It is not seen how Hobgood in any manner teaches that wear of a pipe may be determined by measuring a temperature. In Hobgood, the existence of a leak must first be detected and then the temperature sensor is provided in order to detect the location and severity of the leak. Granted, a temperature sensing system including the cooling coils could be provided at any location on a pipe in accordance with Hobgood even in the absence of a leak, but unless the location of the measuring device is somehow related to the location of the leak, the effectiveness of the temperature measurement is problematic. A careful reading of the Hobgood patent would appear to be in order on the part of the Examiner and the Examiner should provide a more detailed indication of precisely how a person skilled in the art would be led to utilize the teachings of Hobgood in combination with Yamashita to result in the invention described and claimed in the present application.

In a similar manner, Turek simply indicates that a temperature of a yarn may be determined by analyzing the temperature of a guide pin in contact with the yarn. This process and apparatus necessarily requires measuring the tension of the yarn with a tensiometer in order to enable estimation of the yarn temperature by measuring the temperature of a guide pin. The Examiner is invited to carefully read the disclosure of Turek and to explain to Applicant why a person skilled in the art would be led by this teaching to somehow insert a temperature sensor in Yamashita, which is not concerned in any manner with the temperature of a rapier band but rather is concerned with the degree of excursion of the band from an initial position relative to a fixed element of the loom. Even if somehow the temperature of the rapier band of Yamashita was detected, there is no teaching in either patent to analyze such temperature to determine a wear characteristic value of the rapier band. The Examiner is invited to provide an explanation to Applicant as to how a person skilled in the art would be led to the discovery of such an inventive feature in the absence of any suggestion whatsoever of this feature in any of the prior art.

The rejection of prior claims 7 and 8 as unpatentable under 37 U.S.C. § 103 in view of Yamashita is believed to be inappropriate for all the reasons discussed previously with regard to the relevancy of the Yamashita and Hobgood references.

With regard to the rejection of claim 1 and other claims under 35 U.S.C. § 103 in view of Yamashita and Schmidt et al. (U.S. 5,352,038), again it is pointed out that none of the these documents remotely suggest analyzing a temperature signal indicative of the temperature of a rapier band as a wear characteristic value of the rapier band in a rapier loom. Yamashita detects movement or change of position of the band, while Schmidt simply teaches contactless measurement of the surface temperature of a moving element using an infrared radiator and thermometer (sensor). As mentioned before, this invention is not about thermal measurement and it is not about detecting physical characteristics of a moving element simply by measuring temperature of the element. Instead, as clearly indicated in the claims, this invention is about using a temperature signal as a wear characteristic value of

a rapier band of a rapier loom involving at least generating a temperature signal indicative of the temperature of a rapier band, and then analyzing the signal to produce wear information. The temperature signal may be obtained directly or indirectly and may involve measurement of a temperature of a component in contact with the rapier band. Temperature measurements may be taken at separate locations to eliminate the effect of ambient conditions. Clearly, nothing in the prior art remotely suggests the claimed subject matter of this application.

Prior claim 10 was rejected as obvious in view of Yamashita and Hobgood, and further in view of Palti (U.S. 6,220,750).

Palti is relied on by the Examiner to provide missing elements in Yamashita and Hobgood, specifically, the teaching of "a thermally conductive support/pad/material to receive (contact) a first temperature sensor and a sensor located near the rapier band." In the first place, it is not understood how the Examiner observes in Palti a teaching of a temperature sensor located anywhere near a rapier band and furthermore, it is not understood where the Examiner observes any temperature sensor at all in Yamashita and Hobgood that is or could be imputed as associated with a rapier band of a rapier loom.

It is not disputed that Palti teaches a thermally conducting material provided between a surface of interest and a temperature sensor to ensure a better thermal contact. Beyond this bare teaching, it is not understood how the Examiner can presume that a person skilled in the art would rely on this teaching to add a thermally conductive material to any device disclosed by Yamashita or Hobgood. Yamashita and Hobgood do not provide any suggestion themselves of using, relying on or incorporating any kind of a thermally conductive material in their respective systems, and with regard to Hobgood, it is not understood how the Examiner arrives at the conclusion that the use of a thermally conductive material would provide a better thermal conduction between the object of interest and the temperature sensors, where the temperature sensors are located directly on the pipe material of which the temperature is to be measured. Utilization of a separate thermally

conductive material would only further remove the temperature sensors from the pipe material.

It is respectfully submitted that the attempt by the Examiner to combine the teachings of Yamashita, Hobgood and Palti in the manner suggested in the Examiner's action to reject any claim of this application is not appropriate and withdrawal of such rejection is respectfully requested.

Conclusion

It is respectfully submitted that all objectionable language in the claims of this application have been removed and the claims define subject matter fully patentable over the prior art of record considered individually or in any reasonable combination that is legally appropriate under the patent statute.

In passing, appropriate headings have been added to the specification and an Abstract has been introduced even in the absence of a requirement for same by the Examiner in order to fully place the application in condition for allowance.

Withdrawal of the rejection and passage of the application to issue is respectfully requested.

Respectfully submitted,
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